

Amoldt/a

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SEQUENCE LISTING

<110> WILSON, THOMAS G.
HEINRICH, JULIA N.

<120> RECOMBINANT BHLH-PAS/JHR POLYPEPTIDE AND ITS USE TO
SCREEN POTENTIAL INSECTICIDES

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 His Ala Ala Glu Ser Ser Arg Arg Leu Asp Lys Thr Ala Val Leu Arg
 65 70 75 80
 Phe Ala Thr His Gly Leu Arg Leu Gln Tyr Val Phe Gly Lys Ser Ala
 85 90 95
 Ser Arg Arg Arg Lys Lys Thr Gly Leu Lys Gly Thr Gly Met Ser Ala
 100 105 110

Ser Pro Val Gly Asp Leu Pro Asn Pro Ser Leu His Leu Thr Asp Thr
 115 120 125
 Leu Met Gln Leu Leu Asp Cys Cys Phe Leu Thr Leu Thr Cys Ser Gly
 130 135 140
 Gln Ile Val Leu Val Ser Thr Ser Val Glu Gln Leu Leu Gly His Cys
 145 150 155 160
 Gln Ser Asp Leu Tyr Gly Gln Asn Leu Leu Gln Ile Thr His Pro Asp
 165 170 175
 Asp Gln Asp Leu Leu Arg Gln Gln Leu Ile Pro Arg Asp Ile Glu Thr
 180 185 190
 Leu Phe Tyr Gln His Gln His His Gln Gln Gln Gly His Asn Pro Gln
 195 200 205
 Gln His Ser Thr Ser Thr Ser Ala Ser Xaa Ser Gly Ser Asp Leu Glu
 210 215 220
 Glu Glu Glu Met Glu Thr Glu Glu His Arg Leu Gly Arg Gln Gln Gly
 225 230 235 240
 Glu Ala Asp Asp Asp Glu Asp His Pro Tyr Asn Arg Arg Thr Pro Ser
 245 250 255
 Pro Arg Arg Met Ala His Leu Ala Thr Ile Asp Asp Arg Leu Arg Met
 260 265 270
 Asp Arg Arg Cys Phe Thr Val Arg Leu Ala Arg Ala Ser Thr Arg Ala
 275 280 285
 Glu Ala Thr Arg His Tyr Glu Arg Val Lys Ile Asp Gly Cys Phe Arg
 290 295 300
 Arg Ser Asp Ser Ser Leu Thr Gly Gly Ala Ala Ala Asn Tyr Pro Ile
 305 310 315 320
 Val Ser Gln Leu Ile Arg Arg Ser Arg Asn Asn Asn Met Leu Ala Ala
 325 330 335
 Ala Ala Ala Val Ala Ala Glu Ala Ala Thr Val Pro Pro Gln His Asp
 340 345 350
 Ala Ile Ala Gln Ala Ala Leu His Gly Ile Ser Gly Asn Asp Ile Val
 355 360 365
 Leu Val Ala Met Ala Arg Val Leu Arg Glu Glu Arg Pro Pro Glu Glu
 370 375 380
 Thr Glu Gly Thr Val Gly Leu Thr Ile Tyr Arg Gln Pro Glu Pro Tyr
 385 390 395 400
 Gln Leu Glu Tyr His Thr Arg His Leu Ile Asp Gly Ser Ile Ile Asp
 405 410 415

Cys Asp Gln Arg Ile Gly Leu Val Ala Gly Tyr Met Lys Asp Glu Val
 420 425 430
 Gly Ile Leu Thr Ser Ser Leu Thr Ala Tyr Asp Asn Ser Cys Thr Leu
 435 440 445
 His Ser Lys Gln Val Arg Asn Leu Ser Pro Phe Cys Phe Met His Leu
 450 455 460
 Asp Asp Val Arg Trp Val Ile Val Ala Leu Arg Gln Met Tyr Asp Cys
 465 470 475 480
 Asn Ser Asp Tyr Gly Glu Ser Cys Tyr Arg Leu Leu Ser Arg Asn Gly
 485 490 495
 Arg Phe Ile Tyr Leu His Thr Lys Gly Phe Leu Glu Val Asp Arg Gly
 500 505 510
 Ser Asn Lys Val His Ser Phe Leu Cys Val Asn Thr Leu Leu Asp Glu
 515 520 525
 Glu Ala Gly Arg Gln Lys Val Gln Glu Met Lys Glu Lys Phe Ser Thr
 530 535 540
 Ile Ile Lys Ala Glu Met Pro Thr Gln Ser Ser Ser Pro Asp Leu Pro
 545 550 555 560
 Ala Ser Gln Ala Pro Gln Gln Leu Glu Arg Ile Val Leu Tyr Leu Ile
 565 570 575
 Glu Asn Leu Gln Lys Ser Val Asp Ser Ala Glu Thr Val Gly Gly Gln
 580 585 590
 Gly Met Glu Ser Leu Met Asp Asp Gly Tyr Ser Ser Pro Ala Asn Thr
 595 600 605
 Leu Thr Leu Glu Glu Leu Ala Pro Ser Pro Thr Pro Ala Leu Ala Leu
 610 615 620
 Val Pro Pro Ala Pro Ser Ser Val Lys Ser Ser Ile Ser Lys Ser Val
 625 630 635 640
 Ser Val Val Asn Val Thr Ala Ala Arg Lys Phe Gln Gln Glu His Gln
 645 650 655
 Lys Gln Arg Glu Arg Asp Arg Glu Gln Leu Lys Glu Arg Thr Asn Ser
 660 665 670
 Thr Gln Gly Val Ile Arg Gln Leu Ser Ser Cys Leu Ser Glu Ala Glu
 675 680 685
 Thr Ala Ser Cys Ile Leu Ser Pro Ala Ser Ser Leu Ser Ala Ser Glu
 690 695 700
 Ala Pro Asp Thr Pro Asp Pro His Ser Asn Thr Ser Pro Pro Pro Ser
 705 710 715 720

Leu His Thr Arg Pro Ser Val Leu His Arg Thr Leu Thr Ser Thr Leu
 725 730 735

Arg

<210> 5
 <211> 716
 <212> PRT
 <213> Drosophila sp.

<220>
 <221> MOD_RES
 <222> (103)
 <223> Gly or Arg

<400> 5
 Met Ala Ala Pro Glu Thr Gly Asn Thr Gly Ser Thr Gly Ser Ala Gly
 1 5 10 15
 Ser Thr Gly Ser Gly Ser Gly Ser Gly Ser Gly Ser Gly Ser Ser Ser
 20 25 30
 Asp Pro Ala Asn Gly Arg Glu Ala Arg Asn Leu Ala Glu Lys Gln Arg
 35 40 45
 Arg Asp Lys Leu Asn Ala Ser Ile Gln Glu Leu Ala Thr Met Val Pro
 50 55 60
 His Ala Ala Glu Ser Ser Arg Arg Leu Asp Lys Thr Ala Val Leu Arg
 65 70 75 80
 Phe Ala Thr His Gly Leu Arg Leu Gln Tyr Val Phe Gly Lys Ser Ala
 85 90 95
 Ser Arg Arg Arg Lys Lys Xaa Gly Leu Lys Gly Thr Gly Met Ser Ala
 100 105 110
 Ser Pro Val Gly Asp Leu Pro Asn Pro Ser Leu His Leu Thr Asp Thr
 115 120 125
 Leu Met Gln Leu Leu Asp Cys Cys Phe Leu Thr Leu Thr Cys Ser Gly
 130 135 140
 Gln Ile Val Leu Val Ser Thr Ser Val Glu Gln Leu Leu Gly His Cys
 145 150 155 160
 Gln Ser Asp Leu Tyr Gly Gln Asn Leu Leu Gln Ile Thr His Pro Asp
 165 170 175
 Asp Gln Asp Leu Leu Arg Gln Gln Leu Ile Pro Arg Asp Ile Glu Thr
 180 185 190
 Leu Phe Tyr Gln His Gln His His Gln Gln Gln Gly His Asn Pro Gln
 195 200 205
 Gln His Ser Thr Ser Thr Ser Ala Ser Ala Ser Gly Ser Asp Leu Glu
 210 215 220

Glu Glu Glu Met Glu Thr Glu Glu His Arg Leu Gly Arg Gln Gln Gly
 225 230 235 240
 Glu Ala Asp Asp Asp Glu Asp His Pro Tyr Asn Arg Arg Thr Pro Ser
 245 250 255
 Pro Arg Arg Met Ala His Leu Ala Thr Ile Asp Asp Arg Leu Arg Met
 260 265 270
 Asp Trp Arg Cys Phe Thr Val Arg Leu Ala Arg Ala Ser Thr Arg Ala
 275 280 285
 Glu Ala Thr Arg His Tyr Glu Arg Val Lys Ile Asp Gly Cys Phe Arg
 290 295 300
 Arg Ser Asp Ser Ser Leu Thr Gly Gly Ala Ala Ala Asn Tyr Pro Ile
 305 310 315 320
 Val Ser Gln Leu Ile Arg Arg Ser Arg Asn Asn Asn Met Leu Ala Ala
 325 330 335
 Ala Ala Ala Val Ala Ala Glu Ala Ala Thr Val Pro Pro Gln His Asp
 340 345 350
 Ala Ile Ala Gln Ala Ala Leu His Gly Ile Ser Gly Asn Asp Ile Val
 355 360 365
 Leu Val Ala Met Ala Arg Val Leu Arg Glu Glu Arg Pro Pro Glu Glu
 370 375 380
 Thr Glu Gly Thr Val Gly Leu Thr Ile Tyr Arg Gln Pro Glu Pro Tyr
 385 390 395 400
 Gln Leu Glu Tyr His Thr Arg His Leu Ile Asp Gly Ser Ile Ile Asp
 405 410 415
 Cys Asp Gln Arg Ile Gly Leu Val Ala Gly Tyr Met Lys Asp Glu Val
 420 425 430
 Arg Asn Leu Ser Pro Phe Cys Phe Met His Leu Asp Asp Val Arg Trp
 435 440 445
 Val Ile Val Ala Leu Arg Gln Met Tyr Asp Cys Asn Ser Asp Tyr Gly
 450 455 460
 Glu Ser Cys Tyr Arg Leu Leu Ser Arg Asn Gly Arg Phe Ile Tyr Leu
 465 470 475 480
 His Thr Lys Gly Phe Leu Glu Val Asp Arg Gly Ser Asn Lys Val His
 485 490 495
 Ser Phe Leu Cys Val Asn Thr Leu Leu Asp Glu Glu Ala Gly Arg Gln
 500 505 510
 Lys Val Gln Glu Met Lys Glu Lys Phe Ser Thr Ile Ile Lys Ala Glu
 515 520 525

Met Pro Thr Gln Ser Ser Ser Pro Asp Leu Pro Ala Ser Gln Ala Pro
530 535 540

Gln Gln Leu Glu Arg Ile Val Leu Tyr Leu Ile Glu Asn Leu Gln Lys
545 550 555 560

Ser Val Asp Ser Ala Glu Thr Val Gly Gly Gln Gly Met Glu Ser Leu
565 570 575

Met Asp Asp Gly Tyr Ser Ser Pro Ala Asn Thr Leu Thr Leu Glu Glu
580 585 590

Leu Ala Pro Ser Pro Thr Pro Ala Leu Ala Leu Val Pro Pro Ala Pro
595 600 605

Ser Ser Val Lys Ser Ser Ile Ser Lys Ser Val Ser Val Val Asn Val
610 615 620

Thr Ala Ala Arg Lys Phe Gln Gln Glu His Gln Lys Gln Arg Glu Arg
625 630 635 640

Asp Arg Glu Gln Leu Lys Glu Arg Thr Asn Ser Thr Gln Gly Val Ile
645 650 655

Arg Gln Leu Ser Ser Cys Leu Ser Glu Ala Glu Thr Ala Ser Cys Ile
660 665 670

Leu Ser Pro Ala Ser Ser Leu Ser Ala Ser Glu Ala Pro Asp Thr Pro
675 680 685

Asp Pro His Ser Asn Thr Ser Pro Pro Pro Ser Leu His Thr Arg Pro
690 695 700

Ser Val Leu His Arg Thr Leu Thr Ser Thr Leu Arg
705 710 715

<210> 6

<211> 250

<212> DNA

<213> *Drosophila melanogaster*

<400> 6

atggcagcac cagagacggg caacacgggc tccacaggat ccgctggctc gacaggatcg 60
ggatcgggat cgggatcggg aagtgggagc tcctcagatc cagcgaatgg acgggaggcc 120
cgtaaccttg ccgaaaaaca gcgacgggat aagcttaatg ccagcatcca ggagctggct 180
accatggtag cacatgcagc cgaatcctcc cgtcgctggg acaaaaccgc cgtccttaga 240
ttcgccaccc 250

<210> 7

<211> 232

<212> DNA

<213> *Drosophila erecta*

<400> 7

cagcagacgc gggcaacacg ggcaccacag gatcagctgg gtccacagga tctggatcgg 60
gaactgggac gtccgcagat ccagcgaatg gacgggaggc ccgcaatctt gccgagaaac 120
agcgacggga taagcttaat gccagcatcc aggagctggc taccatggta ccacatgtca 180

gccgaatcct cccgacgcct ggacaaaacc gccgtcctca gattcgccac cc

232

<210> 8

<211> 631

<212> PRT

<213> Drosophila sp.

<400> 8

Met Asp Glu Ala Asn Ile Gln Asp Lys Glu Arg Phe Ala Ser Arg Glu
1 5 10 15

Asn His Cys Glu Ile Glu Arg Arg Arg Arg Asn Lys Met Thr Ala Tyr
20 25 30

Ile Thr Glu Leu Ser Asp Met Val Pro Thr Cys Ser Ala Leu Ala Arg
35 40 45

Lys Pro Asp Lys Leu Thr Ile Leu Arg Met Ala Val Ala His Met Lys
50 55 60

Ala Leu Arg Gly Thr Gly Asn Thr Ser Ser Asp Gly Thr Tyr Lys Pro
65 70 75 80

Ser Phe Leu Thr Asp Gln Glu Leu Lys His Leu Ile Leu Glu Ala Ala
85 90 95

Asp Gly Phe Leu Phe Val Val Ser Cys Asp Ser Gly Arg Val Ile Tyr
100 105 110

Val Ser Asp Ser Val Thr Pro Val Leu Asn Tyr Thr Gln Ser Asp Trp
115 120 125

Tyr Gly Thr Ser Leu Tyr Glu His Ile His Pro Asp Asp Arg Glu Lys
130 135 140

Ile Arg Glu Gln Leu Ser Thr Gln Glu Ser Gln Asn Ala Gly Arg Ile
145 150 155 160

Leu Asp Leu Lys Ser Gly Thr Val Lys Lys Glu Gly His Gln Ser Ser
165 170 175

Met Arg Leu Ser Met Gly Ala Arg Arg Gly Phe Ile Cys Met Arg Val
180 185 190

Gly Asn Val Asn Pro Glu Ser Met Val Ser Gly His Leu Asn Arg Leu
195 200 205

Lys Gln Arg Asn Ser Leu Gly Pro Ser Arg Asp Gly Thr Asn Tyr Ala
210 215 220

Val Val His Cys Thr Gly Tyr Ile Lys Asn Trp Pro Pro Thr Asp Met
225 230 235 240

Phe Pro Asn Met His Met Glu Arg Asp Val Asp Asp Met Ser Ser His
245 250 255

Cys Cys Leu Val Ala Ile Gly Arg Leu Gln Val Thr Ser Thr Ala Ala
 260 265 270
 Asn Asp Met Ser Gly Ser Asn Asn Gln Ser Glu Phe Ile Thr Arg His
 275 280 285
 Ala Met Asp Gly Lys Phe Thr Phe Val Asp Gln Arg Val Leu Asn Ile
 290 295 300
 Leu Gly Tyr Thr Pro Thr Glu Leu Leu Gly Lys Ile Cys Tyr Asp Phe
 305 310 315 320
 Phe His Pro Glu Asp Gln Ser His Met Lys Glu Ser Phe Asp Gln Val
 325 330 335
 Leu Lys Gln Lys Gly Gln Met Phe Ser Leu Leu Tyr Arg Ala Arg Ala
 340 345 350
 Lys Asn Ser Glu Tyr Tyr Val Trp Leu Arg Thr Gln Ala Tyr Ala Phe
 355 360 365
 Leu Asn Pro Tyr Thr Asp Glu Val Glu Tyr Ile Val Cys Thr Asn Ser
 370 375 380
 Ser Gly Lys Thr Met His Gly Ala Pro Leu Asp Ala Ala Ala Ala His
 385 390 395 400
 Thr Pro Glu Gln Val Gln Gln Gln Gln Gln Gln Gln Glu Gln His
 405 410 415
 Val Tyr Val Gln Ala Ala Pro Gly Val Asp Tyr Ala Arg Arg Glu Leu
 420 425 430
 Thr Pro Val Gly Ser Ala Thr Asn Asp Gly Met Tyr Gln Thr His Met
 435 440 445
 Leu Ala Met Gln Ala Pro Thr Pro Gln Gln Gln Gln Gln Gln Gln Gln
 450 455 460
 Arg Pro Gly Ser Ala Gln Thr Thr Pro Val Gly Tyr Thr Tyr Asp Thr
 465 470 475 480
 Thr His Ser Pro Tyr Ser Ala Gly Gly Thr Ser Pro Leu Ala Lys Ile
 485 490 495
 Pro Lys Ser Gly Thr Ser Pro Thr Pro Val Ala Pro Asn Ser Trp Ala
 500 505 510
 Ala Leu Arg Pro Gln Gln Gln Gln Gln Gln Gln Gln Pro Val Thr Glu
 515 520 525
 Gly Tyr Gln Tyr Gln Gln Thr Ser Pro Ala Arg Ser Pro Ser Gly Pro
 530 535 540
 Thr Tyr Thr Gln Leu Ser Ala Gly Asn Gly Asn Arg Gln Gln Ala Gln
 545 550 555 560

Pro Gly Ala Tyr Gln Ala Gly Pro Pro Pro Pro Pro Asn Ala Pro Gly
565 570 575

Met Trp Asp Trp Gln Gln Ala Gly Gly His Pro His Pro Pro His Pro
580 585 590

Thr Ala His Pro His His Pro His Ala His Pro Gly Gly Pro Ala Gly
595 600 605

Ala Gly Gln Pro Gln Gly Gln Gly Val Leu Arg Tyr Ala Ala Asp Val
610 615 620

Gly Ser His Ala Asp His Val
625 630

<210> 9

<211> 789

<212> PRT

<213> Homo sapiens

<400> 9

Met Ala Ala Thr Thr Ala Asn Pro Glu Met Thr Ser Asp Val Pro Ser
1 5 10 15

Leu Gly Pro Ala Ile Ala Ser Gly Asn Ser Gly Pro Gly Ile Gln Gly
20 25 30

Gly Gly Ala Ile Val Gln Arg Ala Ile Lys Arg Arg Pro Gly Leu Asp
35 40 45

Phe Asp Asp Asp Gly Glu Gly Asn Ser Lys Phe Leu Arg Cys Asp Asp
50 55 60

Asp Gln Met Ser Asn Asp Lys Glu Arg Phe Ala Arg Ser Asp Asp Glu
65 70 75 80

Gln Ser Ser Ala Asp Lys Glu Arg Leu Ala Arg Glu Asn His Ser Glu
85 90 95

Ile Glu Arg Arg Arg Arg Asn Lys Met Thr Ala Tyr Ile Thr Glu Leu
100 105 110

Ser Asp Met Val Pro Thr Cys Ser Ala Leu Ala Arg Lys Pro Asp Lys
115 120 125

Leu Thr Ile Leu Arg Met Ala Val Ser His Met Lys Ser Leu Arg Gly
130 135 140

Thr Gly Asn Thr Ser Thr Asp Gly Ser Tyr Lys Pro Ser Phe Leu Thr
145 150 155 160

Asp Gln Glu Leu Lys His Leu Ile Leu Glu Ala Ala Asp Gly Phe Leu
165 170 175

Phe Ile Val Ser Cys Glu Thr Gly Arg Val Val Tyr Val Ser Asp Ser
180 185 190

Val	Thr	Pro	Val	Leu	Asn	Gln	Pro	Gln	Ser	Glu	Trp	Phe	Gly	Ser	Thr	195	200	205	
Leu	Tyr	Asp	Gln	Val	His	Pro	Asp	Asp	Val	Asp	Lys	Leu	Arg	Glu	Gln	210	215	220	
Leu	Ser	Thr	Ser	Glu	Asn	Ala	Leu	Thr	Gly	Arg	Ile	Leu	Asp	Leu	Lys	225	230	235	240
Thr	Gly	Thr	Val	Lys	Lys	Glu	Gly	Gln	Gln	Ser	Ser	Met	Arg	Met	Cys	245	250	255	
Met	Gly	Ser	Arg	Arg	Ser	Phe	Ile	Cys	Arg	Met	Arg	Cys	Gly	Ser	Ser	260	265	270	
Ser	Val	Asp	Pro	Val	Ser	Val	Asn	Arg	Leu	Ser	Phe	Val	Arg	Asn	Arg	275	280	285	
Cys	Arg	Asn	Gly	Leu	Gly	Ser	Val	Lys	Asp	Gly	Glu	Pro	His	Phe	Val	290	295	300	
Val	Val	His	Cys	Thr	Gly	Tyr	Ile	Lys	Ala	Trp	Pro	Pro	Ala	Gly	Val	305	310	315	320
Ser	Leu	Pro	Asp	Asp	Asp	Pro	Glu	Ala	Gly	Gln	Gly	Ser	Lys	Phe	Cys	325	330	335	
Leu	Val	Ala	Ile	Gly	Arg	Leu	Gln	Val	Thr	Ser	Ser	Pro	Asn	Cys	Thr	340	345	350	
Asp	Met	Ser	Asn	Val	Cys	Gln	Pro	Thr	Glu	Phe	Ile	Ser	Arg	His	Asn	355	360	365	
Ile	Glu	Gly	Ile	Phe	Thr	Phe	Val	Asp	His	Arg	Cys	Val	Ala	Thr	Val	370	375	380	
Gly	Tyr	Gln	Pro	Gln	Glu	Leu	Leu	Gly	Lys	Asn	Ile	Val	Glu	Phe	Cys	385	390	395	400
His	Pro	Glu	Asp	Gln	Gln	Leu	Leu	Arg	Asp	Ser	Phe	Gln	Gln	Val	Val	405	410	415	
Lys	Leu	Lys	Gly	Gln	Val	Leu	Ser	Val	Met	Phe	Arg	Phe	Arg	Ser	Lys	420	425	430	
Asn	Gln	Glu	Trp	Leu	Trp	Met	Arg	Thr	Ser	Ser	Phe	Thr	Phe	Gln	Asn	435	440	445	
Pro	Tyr	Ser	Asp	Glu	Ile	Glu	Tyr	Ile	Ile	Cys	Thr	Asn	Thr	Asn	Val	450	455	460	
Lys	Asn	Ser	Ser	Gln	Glu	Pro	Arg	Pro	Thr	Leu	Ser	Asn	Thr	Ile	Gln	465	470	475	480
Arg	Pro	Gln	Leu	Gly	Pro	Thr	Ala	Asn	Leu	Pro	Leu	Glu	Met	Gly	Ser	485	490	495	

Gly Gln Leu Ala Pro Arg Gln Gln Gln Gln Gln Thr Glu Leu Asp Met
 500 505 510
 Val Pro Gly Arg Asp Gly Leu Ala Ser Tyr Asn His Ser Gln Val Val
 515 520 525
 Gln Pro Val Thr Thr Thr Gly Pro Glu His Ser Lys Pro Leu Glu Lys
 530 535 540
 Ser Asp Gly Leu Phe Ala Gln Asp Arg Asp Pro Arg Phe Ser Glu Ile
 545 550 555 560
 Tyr His Asn Ile Asn Ala Asp Gln Ser Lys Gly Ile Ser Ser Ser Thr
 565 570 575
 Val Pro Ala Thr Gln Gln Leu Phe Ser Gln Gly Asn Thr Phe Pro Pro
 580 585 590
 Thr Pro Arg Pro Ala Glu Asn Phe Arg Asn Ser Gly Leu Ala Pro Pro
 595 600 605
 Val Thr Ile Val Gln Pro Ser Ala Ser Ala Gly Gln Met Leu Ala Gln
 610 615 620
 Ile Ser Arg His Ser Asn Pro Thr Gln Gly Ala Thr Pro Thr Trp Thr
 625 630 635 640
 Pro Thr Thr Arg Ser Gly Phe Ser Ala Gln Gln Val Ala Thr Gln Ala
 645 650 655
 Thr Ala Lys Thr Arg Thr Ser Gln Phe Gly Val Gly Ser Phe Gln Thr
 660 665 670
 Pro Ser Ser Phe Ser Ser Met Ser Leu Pro Gly Ala Pro Thr Ala Ser
 675 680 685
 Pro Gly Ala Ala Ala Tyr Pro Ser Leu Thr Asn Arg Gly Ser Asn Phe
 690 695 700
 Ala Pro Glu Thr Gly Gln Thr Ala Gly Gln Phe Gln Thr Arg Thr Ala
 705 710 715 720
 Glu Gly Val Gly Val Trp Pro Gln Trp Gln Gly Gln Gln Pro His His
 725 730 735
 Arg Ser Ser Ser Ser Glu Gln His Val Gln Gln Pro Pro Ala Gln Gln
 740 745 750
 Pro Gly Gln Pro Glu Val Phe Gln Glu Met Leu Ser Met Leu Gly Asp
 755 760 765
 Gln Ser Asn Ser Tyr Asn Asn Glu Glu Phe Pro Asp Leu Thr Met Phe
 770 775 780
 Pro Pro Phe Ser Glu
 785

<210> 10
 <211> 626
 <212> PRT
 <213> Unknown

<220>

<223> Description of Unknown Sequence: Bmall amino acid
 sequence

<400> 10

Met	Ala	Asp	Gln	Arg	Met	Asp	Ile	Ser	Ser	Thr	Ile	Ser	Asp	Phe	Met	1	5	10	15
Ser	Pro	Gly	Pro	Thr	Asp	Leu	Leu	Ser	Ser	Ser	Leu	Gly	Thr	Ser	Gly	20	25	30	
Val	Asp	Cys	Asn	Arg	Lys	Arg	Lys	Gly	Ser	Ser	Thr	Asp	Tyr	Gln	Glu	35	40	45	
Ser	Met	Asp	Thr	Asp	Lys	Asp	Asp	Pro	His	Gly	Arg	Leu	Glu	Tyr	Thr	50	55	60	
Glu	His	Gln	Gly	Arg	Ile	Lys	Asn	Ala	Arg	Glu	Ala	His	Ser	Gln	Ile	65	70	75	80
Glu	Lys	Arg	Arg	Arg	Asp	Lys	Met	Asn	Ser	Phe	Ile	Asp	Glu	Leu	Ala	85	90	95	
Ser	Leu	Val	Pro	Thr	Cys	Asn	Ala	Met	Ser	Arg	Lys	Leu	Asp	Lys	Leu	100	105	110	
Thr	Val	Leu	Arg	Met	Ala	Val	Gln	His	Met	Arg	Thr	Leu	Arg	Gly	Ala	115	120	125	
Thr	Asn	Pro	Tyr	Thr	Glu	Ala	Asn	Tyr	Lys	Pro	Thr	Phe	Leu	Ser	Asp	130	135	140	
Asp	Glu	Leu	Lys	His	Leu	Ile	Leu	Arg	Ala	Ala	Asp	Gly	Phe	Leu	Phe	145	150	155	160
Val	Val	Gly	Cys	Asp	Arg	Gly	Lys	Ile	Leu	Phe	Val	Ser	Glu	Ser	Val	165	170	175	
Phe	Lys	Ile	Leu	Asn	Tyr	Ser	Gln	Asn	Asp	Leu	Ile	Gly	Gln	Ser	Leu	180	185	190	
Phe	Asp	Tyr	Leu	His	Pro	Lys	Asp	Ile	Ala	Lys	Val	Lys	Glu	Gln	Leu	195	200	205	
Ser	Ser	Ser	Asp	Thr	Ala	Pro	Arg	Glu	Arg	Leu	Ile	Asp	Ala	Lys	Thr	210	215	220	
Gly	Leu	Pro	Val	Lys	Thr	Asp	Ile	Thr	Pro	Gly	Pro	Ser	Arg	Leu	Cys	225	230	235	240
Ser	Gly	Ala	Arg	Arg	Ser	Phe	Phe	Cys	Arg	Met	Lys	Cys	Asn	Arg	Pro	245	250	255	

Ser Val Lys Val Glu Asp Lys Asp Phe Pro Ser Thr Cys Ser Lys Lys
 260 265 270
 Lys Ala Asp Arg Lys Ser Phe Cys Thr Ile His Ser Thr Gly Tyr Leu
 275 280 285
 Lys Ser Trp Pro Pro Thr Lys Met Gly Leu Asp Glu Asp Asn Glu Pro
 290 295 300
 Asp Asn Glu Gly Cys Asn Leu Ser Cys Leu Val Ala Ile Gly Arg Leu
 305 310 315 320
 His Ser His Val Val Pro Gln Pro Val Asn Gly Glu Ile Arg Val Lys
 325 330 335
 Ser Met Glu Tyr Val Ser Arg His Ala Ile Asp Gly Lys Phe Val Phe
 340 345 350
 Val Asp Gln Arg Ala Thr Ala Ile Leu Ala Tyr Leu Pro Gln Glu Leu
 355 360 365
 Leu Gly Thr Ser Cys Tyr Glu Tyr Phe His Gln Asp Asp Ile Gly His
 370 375 380
 Leu Ala Glu Cys His Arg Gln Val Leu Gln Thr Arg Glu Lys Ile Thr
 385 390 395 400
 Thr Asn Cys Tyr Lys Phe Lys Ile Lys Asp Gly Ser Phe Ile Thr Leu
 405 410 415
 Arg Ser Arg Trp Phe Ser Phe Met Asn Pro Trp Thr Lys Glu Val Glu
 420 425 430
 Tyr Ile Val Ser Thr Asn Thr Val Val Leu Ala Asn Val Leu Glu Gly
 435 440 445
 Gly Asp Pro Thr Phe Pro Gln Leu Thr Ala Ser Pro His Ser Met Asp
 450 455 460
 Ser Met Leu Pro Ser Gly Glu Gly Gly Pro Lys Arg Thr His Pro Thr
 465 470 475 480
 Val Pro Gly Ile Pro Gly Gly Thr Arg Ala Gly Ala Gly Lys Ile Gly
 485 490 495
 Arg Met Ile Ala Glu Glu Ile Met Glu Ile His Arg Ile Arg Gly Ser
 500 505 510
 Ser Pro Ser Ser Cys Gly Ser Ser Pro Leu Asn Ile Thr Ser Thr Pro
 515 520 525
 Pro Pro Asp Ala Ser Ser Pro Gly Gly Lys Lys Ile Leu Asn Gly Gly
 530 535 540
 Thr Pro Asp Ile Pro Ser Ser Gly Leu Leu Ser Gly Gln Ala Gln Glu
 545 550 555 560

Asn Pro Gly Tyr Pro Tyr Ser Asp Ser Ser Ser Ile Leu Gly Glu Asn
565 570 575

Pro His Ile Gly Ile Asp Met Ile Asp Asn Asp Gln Gly Ser Ser Ser
580 585 590

Pro Ser Asn Asp Glu Ala Ala Met Ala Val Ile Met Ser Leu Leu Glu
595 600 605

Ala Asp Ala Gly Leu Gly Gly Pro Val Asp Phe Ser Asp Leu Pro Trp
610 615 620

Pro Leu
625

<210> 11

<211> 716

<212> PRT

<213> Drosophila sp.

<400> 11

Met Ala Ala Pro Glu Thr Gly Asn Thr Gly Ser Thr Gly Ser Ala Gly
1 5 10 15

Ser Thr Gly Ser Gly Ser Gly Ser Gly Ser Gly Ser Gly Ser Ser Ser
20 25 30

Asp Pro Ala Asn Gly Arg Glu Ala Arg Asn Leu Ala Glu Lys Gln Arg
35 40 45

Arg Asp Lys Leu Asn Ala Ser Ile Gln Glu Leu Ala Thr Met Val Pro
50 55 60

His Ala Ala Glu Ser Ser Arg Arg Leu Asp Lys Thr Ala Val Leu Arg
65 70 75 80

Phe Ala Thr His Gly Leu Arg Leu Gln Tyr Val Phe Gly Lys Ser Ala
85 90 95

Ser Arg Arg Arg Lys Lys Pro Gly Leu Lys Gly Thr Gly Met Ser Ala
100 105 110

Ser Pro Val Gly Asp Leu Pro Asn Pro Ser Leu His Leu Thr Asp Thr
115 120 125

Leu Met Gln Leu Leu Asp Cys Cys Phe Leu Thr Leu Thr Cys Ser Gly
130 135 140

Gln Ile Val Leu Val Ser Thr Ser Val Glu Gln Leu Leu Gly His Cys
145 150 155 160

Gln Ser Asp Leu Tyr Gly Gln Asn Leu Leu Gln Ile Thr His Pro Asp
165 170 175

Asp Gln Asp Leu Leu Arg Gln Gln Leu Ile Pro Arg Asp Ile Glu Thr
180 185 190

Leu Phe Tyr Gln His Gln His His Gln Gln Gln Gly His Asn Pro Gln
 195 200 205
 Gln His Ser Thr Ser Thr Ser Ala Ser Ala Ser Gly Ser Asp Leu Glu
 210 215 220
 Glu Glu Glu Met Glu Thr Glu Glu His Arg Leu Gly Arg Gln Gln Gly
 225 230 235 240
 Glu Ala Asp Asp Asp Glu Asp His Pro Tyr Asn Arg Arg Thr Pro Ser
 245 250 255
 Pro Arg Arg Met Ala His Leu Ala Thr Ile Asp Asp Arg Leu Arg Met
 260 265 270
 Asp Trp Arg Cys Phe Thr Val Arg Leu Ala Arg Ala Ser Thr Arg Ala
 275 280 285
 Glu Ala Thr Arg His Tyr Glu Arg Val Lys Ile Asp Gly Cys Phe Arg
 290 295 300
 Arg Ser Asp Ser Ser Leu Thr Gly Gly Ala Ala Ala Asn Tyr Pro Ile
 305 310 315 320
 Val Ser Gln Leu Ile Arg Arg Ser Arg Asn Asn Asn Met Leu Ala Ala
 325 330 335
 Ala Ala Ala Val Ala Ala Glu Ala Ala Thr Val Pro Pro Gln His Asp
 340 345 350
 Ala Ile Ala Gln Ala Ala Leu His Gly Ile Ser Gly Asn Asp Ile Val
 355 360 365
 Leu Val Ala Met Ala Arg Val Leu Arg Glu Glu Arg Pro Pro Glu Glu
 370 375 380
 Thr Glu Gly Thr Val Gly Leu Thr Ile Tyr Arg Gln Pro Glu Pro Tyr
 385 390 395 400
 Gln Leu Glu Tyr His Thr Arg His Leu Ile Asp Gly Ser Ile Ile Asp
 405 410 415
 Cys Asp Gln Arg Ile Gly Leu Val Ala Gly Tyr Met Lys Asp Glu Val
 420 425 430
 Arg Asn Leu Ser Pro Phe Cys Phe Met His Leu Asp Asp Val Arg Trp
 435 440 445
 Val Ile Val Ala Leu Arg Gln Met Tyr Asp Cys Asn Ser Asp Tyr Gly
 450 455 460
 Glu Ser Cys Tyr Arg Leu Leu Ser Arg Asn Gly Arg Phe Ile Tyr Leu
 465 470 475 480
 His Thr Lys Gly Phe Leu Glu Val Asp Arg Gly Ser Asn Lys Val His
 485 490 495

Ser Phe Leu Cys Val Asn Thr Leu Leu Asp Glu Glu Ala Gly Arg Gln
 500 505 510
 Lys Val Gln Glu Met Lys Glu Lys Phe Ser Thr Ile Ile Lys Ala Glu
 515 520 525
 Met Pro Thr Gln Ser Ser Ser Pro Asp Leu Pro Ala Ser Gln Ala Pro
 530 535 540
 Gln Gln Leu Glu Arg Ile Val Leu Tyr Leu Ile Glu Asn Leu Gln Lys
 545 550 555 560
 Ser Val Asp Ser Ala Glu Thr Val Gly Gly Gln Gly Met Glu Ser Leu
 565 570 575
 Met Asp Asp Gly Tyr Ser Ser Pro Ala Asn Thr Leu Thr Leu Glu Glu
 580 585 590
 Leu Ala Pro Ser Pro Thr Pro Ala Leu Ala Leu Val Pro Pro Ala Pro
 595 600 605
 Ser Ser Val Lys Ser Ser Ile Ser Lys Ser Val Ser Val Val Asn Val
 610 615 620
 Thr Ala Ala Arg Lys Phe Gln Gln Glu His Gln Lys Gln Arg Glu Arg
 625 630 635 640
 Asp Arg Glu Gln Leu Lys Glu Arg Thr Asn Ser Thr Gln Gly Val Ile
 645 650 655
 Arg Gln Leu Ser Ser Cys Leu Ser Glu Ala Glu Thr Ala Ser Cys Ile
 660 665 670
 Leu Ser Pro Ala Ser Ser Leu Ser Ala Ser Glu Ala Pro Asp Thr Pro
 675 680 685
 Asp Pro His Ser Asn Thr Ser Pro Pro Pro Ser Leu His Thr Arg Pro
 690 695 700
 Ser Val Leu His Arg Thr Leu Thr Ser Thr Leu Arg
 705 710 715

<210> 12

<211> 808

<212> PRT

<213> Homo sapiens

<400> 12

Met Asn Ser Ser Ser Ala Asn Ile Thr Tyr Ala Ser Arg Lys Arg Arg
 1 5 10 15
 Lys Pro Val Gln Lys Thr Val Lys Pro Ile Pro Ala Glu Gly Ile Lys
 20 25 30
 Ser Asn Pro Ser Lys Arg His Arg Asp Arg Leu Asn Thr Glu Leu Asp
 35 40 45

Arg Leu Ala Ser Leu Leu Pro Phe Pro Gln Asp Val Ile Asn Lys Leu
 50 55 60
 Asp Lys Leu Ser Val Leu Arg Leu Ser Val Ser Tyr Leu Arg Ala Lys
 65 70 75 80
 Ser Phe Phe Asp Val Ala Leu Lys Ser Ser Pro Thr Glu Arg Asn Gly
 85 90 95
 Gly Gln Asp Asn Cys Arg Ala Ala Asn Phe Arg Glu Gly Leu Asn Leu
 100 105 110
 Gln Glu Gly Glu Phe Leu Leu Gln Ala Leu Asn Gly Phe Val Leu Val
 115 120 125
 Val Thr Thr Asp Ala Leu Val Phe Tyr Ala Ser Ser Thr Ile Gln Asp
 130 135 140
 Tyr Leu Gly Phe Gln Gln Ser Asp Val Ile His Gln Ser Val Tyr Glu
 145 150 155 160
 Leu Ile His Thr Glu Asp Arg Ala Glu Phe Gln Arg Gln Leu His Trp
 165 170 175
 Ala Leu Asn Pro Ser Gln Cys Thr Glu Ser Gly Gln Gly Ile Glu Glu
 180 185 190
 Ala Thr Gly Leu Pro Gln Thr Val Val Cys Tyr Asn Pro Asp Gln Ile
 195 200 205
 Pro Pro Glu Asn Ser Pro Leu Met Glu Arg Cys Phe Ile Cys Arg Leu
 210 215 220
 Arg Cys Leu Leu Asp Asn Ser Ser Gly Phe Leu Ala Met Asn Phe Gln
 225 230 235 240
 Gly Lys Leu Lys Tyr Leu His Gly Gln Lys Lys Lys Gly Lys Asp Gly
 245 250 255
 Ser Ile Leu Pro Pro Gln Leu Ala Leu Phe Ala Ile Ala Thr Pro Leu
 260 265 270
 Gln Pro Pro Ser Ile Leu Glu Ile Arg Thr Lys Asn Phe Ile Phe Arg
 275 280 285
 Thr Lys His Lys Leu Asp Phe Thr Pro Ile Gly Cys Asp Ala Lys Gly
 290 295 300
 Arg Ile Val Leu Gly Tyr Thr Glu Ala Glu Leu Cys Thr Arg Gly Ser
 305 310 315 320
 Gly Tyr Gln Phe Ile His Ala Ala Asp Met Leu Tyr Cys Ala Glu Ser
 325 330 335
 His Ile Arg Met Ile Lys Thr Gly Glu Ser Gly Met Ile Val Phe Arg
 340 345 350

Leu Leu Thr Lys Asn Asn Arg Trp Thr Trp Val Gln Ser Asn Ala Arg
 355 360 365
 Leu Leu Tyr Lys Asn Gly Arg Pro Asp Tyr Ile Ile Val Thr Gln Arg
 370 375 380
 Pro Leu Thr Asp Glu Glu Gly Thr Glu His Leu Arg Lys Arg Asn Thr
 385 390 395 400
 Lys Leu Pro Phe Met Phe Thr Thr Gly Glu Ala Val Leu Tyr Glu Ala
 405 410 415
 Thr Asn Pro Phe Pro Ala Ile Met Asp Pro Leu Pro Leu Arg Thr Lys
 420 425 430
 Asn Gly Thr Ser Gly Lys Asp Ser Ala Thr Thr Ser Thr Leu Ser Lys
 435 440 445
 Asp Ser Leu Asn Pro Ser Ser Leu Leu Ala Ala Met Met Gln Gln Asp
 450 455 460
 Glu Ser Ile Tyr Leu Tyr Pro Ala Ser Ser Thr Ser Ser Thr Ala Pro
 465 470 475 480
 Phe Glu Asn Asn Phe Phe Asn Glu Ser Met Asn Glu Cys Arg Asn Trp
 485 490 495
 Gln Asp Asn Thr Ala Pro Met Gly Asn Asp Thr Ile Leu Lys His Glu
 500 505 510
 Gln Ile Asp Gln Pro Gln Asp Val Asn Ser Phe Ala Gly Gly His Pro
 515 520 525
 Gly Leu Phe Gln Asp Ser Lys Asn Ser Asp Leu Tyr Ser Ile Met Lys
 530 535 540
 Asn Leu Gly Ile Asp Phe Glu Asp Ile Arg His Met Gln Asn Glu Lys
 545 550 555 560
 Phe Phe Arg Asn Asp Phe Ser Gly Glu Val Asp Phe Arg Asp Ile Asp
 565 570 575
 Leu Thr Asp Glu Ile Leu Thr Tyr Val Gln Asp Ser Leu Ser Lys Ser
 580 585 590
 Pro Phe Ile Pro Ser Asp Tyr Gln Gln Gln Gln Ser Leu Ala Leu Asn
 595 600 605
 Ser Ser Cys Met Val Gln Glu His Leu His Leu Glu Gln Gln Gln Gln
 610 615 620
 His His Gln Lys Gln Val Val Val Glu Pro Gln Gln Gln Leu Cys Gln
 625 630 635 640
 Lys Met Lys His Met Gln Val Asn Gly Met Phe Glu Asn Trp Asn Ser
 645 650 655

Asn Gln Phe Val Pro Phe Asn Cys Pro Gln Gln Asp Pro Gln Gln Tyr
 660 665 670

Asn Val Phe Thr Asp Leu His Gly Ile Ser Gln Glu Phe Pro Tyr Lys
 675 680 685

Ser Glu Met Asp Ser Met Pro Tyr Thr Gln Asn Phe Ile Ser Cys Asn
 690 695 700

Gln Pro Val Leu Pro Gln His Ser Lys Cys Thr Glu Leu Asp Tyr Pro
 705 710 715 720

Met Gly Ser Phe Glu Pro Ser Pro Tyr Pro Thr Thr Ser Ser Leu Glu
 725 730 735

Asp Phe Val Thr Cys Leu Gln Leu Pro Glu Asn Gln Lys His Gly Leu
 740 745 750

Asn Pro Gln Ser Ala Ile Ile Thr Pro Gln Thr Cys Tyr Ala Gly Ala
 755 760 765

Val Ser Met Tyr Gln Cys Gln Pro Glu Pro Gln His Thr His Val Gly
 770 775 780

Gln Met Gln Tyr Asn Pro Val Leu Pro Gly Gln Gln Ala Phe Leu Asn
 785 790 795 800

Lys Phe Gln Asn Gly Val Phe Lys
 805

<210> 13

<211> 10

<212> DNA

<213> Drosophila sp.

<400> 13

caaaatggca